WHAT IS CLAIMED IS:

1. An actuator comprising a substrate and displacement element disposed on the surface of said substrate, said displacement element comprising a piezoelectric ceramic layer and a pair of electrodes interposing therebetween said piezoelectric ceramic layer, said piezoelectric ceramic layer and said substrate having as their principal component a perovskite crystal containing at least Pb, Zr and Ti, the maximum difference in composition ratio Pb/(Ti+Zr) between the surface of said piezoelectric ceramic layer and the inside of said substrate being 0.02 or less, and the entire thickness of said actuator being 100 μ m or less.

2. The actuator according to claim 1 wherein a plurality of said displacement elements are disposed on the surface of said substrate.

3. The actuator according to claim 1 wherein the porosities of said substrate and said piezoelectric ceramic layer are 1 % or less.

4. A method of manufacturing an actuator comprising the steps of:

preparing a laminate by stacking a green sheet having as its principal component a perovskite crystal containing at least Pb, Zr and Ti, and disposing an electrode in the inside and surface of said green sheet; and

firing said laminate under the atmosphere which contains oxygen in high concentration,

the amount of Pb contained in said green sheet being greater than the amount of Pb corresponding to the stoichiometric composition of said perovskite crystal.

5. The method according to claim 4 wherein the excessive amount of Pb contained in said green sheet is 0.99 to 5 wt. % .

6. The method according to claim 4 wherein the density of said green sheet is

4.2 g/cm^2 or more.

7. The method according to claim 4 wherein said laminate is fired at 900℃ to 1100℃.

8. The method according to claim 4 wherein said atmosphere, which contains oxygen in high concentration, contains 98 % or more oxygen.

9. A printing head comprising a passage member having a plurality of ink passages, and an actuator according to claim 1 which is disposed on said passage member, ink charged in said ink passage being discharged by the displacement of said displacement element constituting said actuator.

10. An actuator comprising a ceramic substrate and a plurality of displacement elements disposed on the surface of said substrate, said displacement elements comprising a piezoelectric ceramic layer and a pair of electrodes interposing therebetween said piezoelectric ceramic layer, said piezoelectric ceramic layer comprising a perovskite compound containing Pb, Zr and Ti, the lattice constant ratio c/a of said perovskite compound being 1.013 to 1.016, said actuator having a thickness of 100 μ m or less.

11. The actuator according to claim 10 wherein said perovskite compound is a lead zirconate titanate-based compound.

12. The actuator according to claim 10 wherein said piezoelectric ceramic layer contains at least one selected from Sr, Ba, Ni, Sb, Nb, Zn and Te.

13. The actuator according to claim 12 wherein said piezoelectric ceramic layer contains Ba in an amount of 0.02 to 0.08 mol, and Sr in amount of 0.02 to 0.12 mol.

14. The actuator according to claim 10 wherein said piezoelectric ceramic layer contains Pb exceeding the amount of Pb required from the stoichiometric ratio of said perovskite compound, and the excess ratio at site A is 1.005 to 1.04.

15. The actuator according to claim 10 wherein said ceramic substrate is a piezoelectric element.

16. The actuator according to claim 10 wherein a constraint part is bonded via an adhesive layer to a part of said ceramic substrate, and displacement occurs at a non-constraint part.

17. The actuator according to claim 10 wherein the magnitude of d_{31} is 200 pm/V or more.

18. The actuator according to claim 10 wherein elastic compliance is 14.0×10^{-12} m/N^2 or less.

19. The actuator according to claim 10 wherein the maximum difference in composition ratio Pb/(Ti+Zr) between the surface of said piezoelectric ceramic layer and the inside of said ceramic substrate is 0.02 or less.

20. A printing head comprising a passage member having a plurality of ink passages, and an actuator according to claim 10 which is joined onto said passage member such that displacement element constituting said actuator is located immediately above said ink passage, ink charged in said ink passage being discharged by the displacement of said displacement element.

21. An actuator comprising a substrate, a plurality of displacement elements disposed on one surface of said substrate, and a plurality of constraint parts bonded via an adhesive layer to the other surface of said substrate, said displacement elements being operated independently such that a non-constraint part not constrained by said constraint parts induces displacement, said actuator having an entire thickness of 100 μ m or less and having d constant of 200 pm/V or more, and said adhesive layer having a thickness of 0.5 to 5 μ m.

22. The actuator according to claim 21 wherein the maximum pore diameter

contained in said adhesive layer is 10 μ m or less.

23. The actuator according to claim 21 wherein said displacement element comprises a piezoelectric layer and a pair of electrodes interposing therebetween said piezoelectric layer.

24. The actuator according to claim 21 wherein the principal component constituting said piezoelectric layer is approximately the same as the principal component constituting said substrate.

25. A printing head comprising a substrate, a plurality of displacement elements disposed on one surface of said substrate, and a passage member having a plurality of ink passages which is bonded via an adhesive layer to the other surface of said substrate, said displacement elements being located immediately above said ink passage, each of said displacement elements displacing independently, said actuator having its entire thickness of 100 μ m or less and having d constant of 200 pm/V or more, said adhesive layer having a thickness of 0.5 to 5 μ m, and ink being discharged by the displacement of said displacement elements.